REMARKS

Claims 1 – 3, 5 – 10, and 12 – 15 are currently pending. In view of the following remarks, reconsideration of the application is respectfully requested.

Claims 1 – 3 and 5 – 8 were rejected under 35 U.S.C. 103 as being unpatentable over Kulmburg (U.S. Patent No. 5,039,574) in view of Prasad (U.S. Patent No. 4,530,664) and Applicant's admission of prior art. The Examiner contends that Kulmburg '574 teaches a Co-Cr dental alloy that contains 25 – 35 wt % Cr, 0.01 – 8.0 wt% Mn and the balance Co with other elements being present. The Examiner cites Prasad '664 to show that a Co-Cr dental alloy in the same field of endeavor includes adding 1 – 6 wt% Al to the alloy. Regarding the coefficient of expansion, the Examiner points to Applicant's specification at page 2, lines 11 – 13 that the Examiner contends is admitted as prior art by Applicant. For the reasons set forth below, this rejection is respectfully traversed.

The claimed invention is directed to a cobalt-chromium dental alloy comprising by weight percent about 60 to about 85% cobalt, about 15 to about 30% chromium, about 4 to about 20% manganese, and about 1 to about 15% aluminum, indium, gallium, tin, or germanium, or mixture thereof, wherein the coefficient of thermal expansion (CTE) at room temperature to about 500 °C is about 16 to about 18 x 10^{-6}/°C. Moreover, the claimed invention is directed to a cobalt-chromium dental alloy comprising by weight percent about 65 to about 80% cobalt, about 18 to about 25% chromium, about 4 to about 10% manganese, about 2 to about 10%, iron, nickel, palladium, or platinum, or mixture thereof, about 1 to about 7% aluminum, indium, gallium, tin, or germanium, or mixture thereof, about 1 to about 5% gold, and about 0.1 to about 3% iridium, ruthenium, rhenium, titanium, silicon, or copper, or mixture thereof, wherein the CTE at room temperature to about 500 °C is about 16 to about 18 x 10^{-6}/°C.

The claims require the manganese content to be from about 4 to about 10% by weight of the composition. The Examiner's attention is directed to Table 2 of the instant application which shows examples of the claimed composition wherein each alloy contain 4% or greater manganese by weight. Turning to Table 3, the Examiner is directed to examine the CTE's set forth in the Table. Kulmburg '574 is directed to a cobalt-chromium-manganese-containing alloy having a coefficient of thermal expansion

in the range of 13.7 to 15.5 x 10^{-6}/°C. Turning to the Table in Kulmburg'574, Applicant requests that the Examiner direct his attention to Example 2 which shows the highest content of Mn out of all of the examples and shows the lowest coefficient of thermal expansion. The teaching of Kulmburg '574 actually teaches away from Applicant's claimed invention. Prasad '664 does not cure the deficiencies of Kulmburg '574, since Prasad does not teach an amount of manganese of 4% or greater and does not teach a CTE at room temperature to about 500 °C of about 16 to about 18 x 10^{-6}/°C.

Moreover, the section of the specification at page 2, lines 11 – 13 is part of the SUMMARY OF THE INVENTION, not the BACKGROUND OF THE INVENTION. The Examiner's citation of Applicant's own invention against Applicant's own claims is impermissible. *Grain Processing Corp. v. American Maize-Products Corp.*, 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988). "The invention must be viewed in the context of the art that existed at the time the invention was made and not with hindsight or the specifications of the inventor." *FMC Corp. v. Manitowoc Co.*, 654 F.Supp. 915, 932, 2 USPQ2d 1969, 1980 (N.D. Ill. 1987), *aff'd*, 835 F.2d 1411, 5 USPQ2d 1112 (Fed. Cir. 1987). Also see *Medtrionic, Inc. v. Daig Corp.*, 611 F.Supp 1498, 1534, 227 USPQ 509, 535 (D. Minn. 1985) *aff'd,* 789 F.2d 903, 229 USPQ 664 (Fed. Cir. 1986), *cert. denied*, 479 U.S. 931 (1986). The claimed invention is not rendered obvious by the cited references.

Claims 9, 10, 12 – 15 were rejected under 35 U.S.C. 103 as being unpatentable over Kulmburg '574 in view of Prasad '664 and Applicant's admission of prior art as applied to claims 1 – 3 and 5 – 8 above, and further in view of Chiaramonte (U.S. Patent No. 4,108,642. The Examiner cites Chiaramonte '642 to show that 1 – 40 wt% Au may be added to Co-Cr dental alloys to give the alloy a gold color, lower melting point and to improve the mechanical properties of the alloy. For the reasons set forth below, these rejections are respectfully traversed.

As stated above the combination of Kulmburg '574 and Prasad '684 with applicant's specification is impermissible. Chiaramonte '642 does not cure the deficiencies of the Kulmburg '574 and Prasad '664 references. Chiaramonte '642 is unlike the claimed invention and is unlike the alloy in Prasad '664. The small amount of gold added to the instant invention, 1 to 5 wt %, does not change the color of the white

alloy to a gold color. Chiaramonte '642 is not concerned with a specific coefficient of thermal expansion. The coefficient of thermal expansion of the alloy of the claimed invention is much greater than that taught by Prasad '664. There is no showing or suggestion in Chiaramonte '642 to add or alter components in the composition therein in order to affect or alter the coefficient of expansion. The combination of various metals in an alloy composition is not straightforward depending on which metals are already present, since different combinations will produce overall different results. The purpose of adding gold to the composition of the claimed invention was not to alter the color of the alloy. In fact, the inclusion of gold can compromise the corrosion behavior, if not controlled properly. The claimed invention is not rendered obvious over the combination of cited references

In summary, none of the references, alone or in combination, teach applicant's invention directed to a cobalt-chromium dental alloy comprising by weight percent about 60 to about 85% cobalt, about 15 to about 30% chromium, about 4 to about 20% manganese, and about 1 to about 15% aluminum, indium, gallium, tin, or germanium, or mixture thereof, wherein the coefficient of thermal expansion (CTE) at room temperature to about 500 °C is about 16 to about 18 x 10^{-6}/°C. Moreover, none of the cited references teach applicant's invention directed to a cobalt-chromium dental alloy comprising by weight percent about 65 to about 80% cobalt, about 18 to about 25% chromium, about 4 to about 10% manganese, about 2 to about 10%, iron, nickel, palladium, or platinum, or mixture thereof, about 1 to about 7% aluminum, indium, gallium, tin, or germanium, or mixture thereof, about 1 to about 5% gold, and about 0.1 to about 3% iridium, ruthenium, rhenium, titanium, silicon, or copper, or mixture thereof, wherein the CTE at room temperature to about 500 °C is about 16 to about 18 x 10^{-6}/°C. None of the references show or suggest applicant's claimed invention and notice to this effect is respectfully requested.

Accordingly, it is believed that claims 1 - 3, 5 - 10, and 12 - 15 specify patentable subject matter and are now in condition for allowance. Applicant therefore respectfully requests favorable reconsideration and allowance of this application. The Examiner is requested to telephone Applicant's attorney at the number listed below if it will advance

the prosecution of this case. If necessary, the Examiner is authorized to charge further fees necessary to advance the prosecution in this case from Deposit Account No. 500718.

Respectfully submitted,

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Ann M. Knab
Attorney for Applicant
Registration No. 33,331

Jeneric/Pentron Inc.
53 North Plains Industrial Road
Wallingford, CT 06492
Telephone (203) 265-7397 x508

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